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PRE-APPEAL BRIEF REQUEST FOR REVIEW

Docket Number (Optional)
FIS920030264US1

I hereby certify that this corespondence is being deposited with the United States Postal Service with sufficient postage as first class mail in an envelope addressed to "Mail Stop AF, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450" [37 CFR

on _____

Signature _____

Typed or printed name _____

Application Number	Filed
10/695,748	10/30/2003

First Named Inventor
B. Doris

Art Unit	Examiner
2814	T. Le

Applicant requests review of the final rejection in the above-identified application. No amendments are being filed with this request.

This request is being filed with a notice of appeal.

The review is requested for the reason(s) stated on the attached sheet(s).
Note: No more than five (5) pages may be provided.

I am the

- ☐ applicant/inventor.
- ☐ assignee of record of the entire interest. See 37 CFR 3.71. Statement under 37 CFR 3.73(b) is enclosed. (Form PTO/SB/96)
- ☑ attorney or agent of record. Registration number 33,138
- ☐ attorney or agent acting under 37 CFR 1.34. Registration number if acting under 37 CFR 1.34 _____

Marshall M. Curtis
Signature

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Typed or printed name

(703) 787-9400
Telephone number

January 13, 2006
Date

NOTE: Signatures of all the inventors or assignees of record of the entire interest or their representative(s) are required. Submit multiple forms if more than one signature is required, see below*.

☐ *Total of _ forms are submitted.

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re patent application of

Bruce B. Doris et al. Conf. No.:6189

Serial No.: 10/695,748 Group Art Unit: 2814

Filed: October 30, 2003 Examiner: T. Le

For: STRUCTURE AND METHOD TO ENHANCE BOTH nFET AND pFET PERFORMANCE USING DIFFERENT KINDS OF STRESSED LAYERS

Mail Stop AF
Commissioner for Patents
PO Box 1450
Alexandria, Virginia 22313-1450

ATTACHMENT TO PRE-APPEAL BRIEF REQUEST FOR REVIEW

Sir:

This Pre-Appeal Brief Request for Review is being concurrently filed with a Notice of Appeal. Please charge any fees due for the Notice of Appeal or to gain entry and consideration of this Pre-Appeal Brief Request for Review, to Deposit Account 09-0458 of International Business Machines Corporation (East Fishkill).

The Invention

The invention, as claimed, is a structure for adjusting carrier mobility in a pair of transistors which affects the amount of current that can flow in a transistor. It has been recognized that applying tensile or compressive stresses to the channels of field effect transistors, depending on their respective conductivity types, can increase or decrease carrier (e.g. electron or hole) mobility in the channels of the transistors. Applying a force which increases carrier mobility of transistors (e.g. compressive stress in nFETs and tensile stress for pFETs) assists substantially in maintaining transistor performance as transistors are scaled to small sizes.

In the present invention, compressive stresses are applied by applying a tensile film over or around the gate of nFETs and tensile stresses are applied by

applying a compressive film over or around the gate of pFETs. To simplify masking processes for doing so, a shear force isolating layer is applied over the first tensile or compressive film (after the first film is removed from the transistors of the conductivity type to which it is inappropriate) and a second stressed film having the opposite stress therein may then be applied over the entire device. The shear stress isolating film prevents the stress in the second film from affecting the stress applied to the underlying channel by the first stressed film.

Errors and Omissions

In the Advisory Action mailed December 28, 2005, the Examiner denies entry of the amendments presented December 13, 2005, without providing any reason for doing so. While it is recognized that no amendment may be made as a matter of right after a final action, it is respectfully submitted that 37 C.F.R. §1.116(b) explicitly provides that "amendments may be made ...complying with any requirement of form expressly set forth in a previous office action" and that "[a]mendments presenting rejected claims in better form for consideration on appeal may be admitted." The requested amendments to page 10 and claims 13 - 19 are in direct response to criticisms stated in an objection and rejection in the official action of October 13, 2005, and the amendment to claim 10 improves grammar and clarity of the claim and thus improves form for appeal. All of the requested amendments are minor and none are in any way substantive. No new issue can possibly be raised thereby. Moreover, it was also respectfully pointed out in the response filed December 13, 2005, that the finality of the action of October 13, 2005, was premature and should be withdrawn, allowing the requested amendments to be made as a matter of right. Accordingly, it is respectfully submitted that, in the absence of a stated reason for denying entry of the requested amendments for which entry is explicitly provided in 37 C.F.R. §1.116, the requested amendments should have been entered and such entry is respectfully requested.

In the Advisory Action mailed December 28, 2005, the Examiner states: "the dielectric layer 15 of Hachimine separates the tensile and compressive layers

14a and 14b, respectively. Thus, the dielectric layer would act or function as 'shear force isolation' between layers 14a and 14b." It is respectfully submitted that, by this statement, the Examiner is now clearly and explicitly relying on inherency in the rejection of claims 10 - 12 and 16 - 19 as has been argued throughout the prosecution of this application since Hachimine et al. does not attribute the function of shear force isolation to layer 15 but uses the layer as an etch stop (see paragraph 0207) in order to remove layer 14b where it overlies layer 14a. By the same token, it is respectfully submitted that this statement by the Examiner underscores the impropriety of considering such a function or property to be inherent as has also been argued throughout the prosecution of the application.

Specifically, for anticipation by inherency to be shown, claim recitations which are not directly disclosed in the reference relied upon must *necessarily* flow from subject matter which *is* directly disclosed. Not only does Hachimine et al. fail to attribute shear force isolation to layer 15 but, on the contrary, paragraph 0124 of Hachimine et al. describes the adverse interaction of overlaid stressed films (e.g. the stresses of one film counteract the stresses of the other film) if one of the films is not removed (which removal of film or layer 14b is facilitated by layer 15 acting as an etch stop). Therefore, it logically follows that Hachimine et al. does not observe any shear force isolation property or function derived from layer 15.

In this regard, it is also respectfully pointed out that no shear force isolation property can be logically inferred from the mere fact that layer 15 separates layers 14 a and 14b in the "intermediate product" illustrated in Figures 15 and 16 as the Examiner has asserted. Layer 14b is and must be removed in accordance with the teachings of Hachimine et al. in order for the "final product" device to function in the manner intended and interaction of opposite stresses in layers 14a and 14b is of no importance whatsoever in the "intermediate product" which is not intended to operate at all, much less with enhanced carrier mobility in the intermediate state of manufacture illustrated in Figures 15 and 16. Therefore, the Examiner's assertion in the Advisory Action is clearly illogical based on the

teachings of Hachimine et al. and thus is necessarily grounded in a hindsight interpretation of and unsupported hindsight attribution to Hachimine et al. based solely on the present disclosure and *contrary* to the disclosure of Hachimine et al.

Additionally, it is respectfully submitted, as argued in the response filed December 13, 2005, that no inherent property of function of shear force isolation can be inferred from the disclosure in Hachimine et al. that layer 15 is, for example, silicon oxide (paragraph 0210). As discussed at page 9 of the response filed December 13, 2005, while the shear force isolating film of the present invention is preferably a dielectric oxide, not all forms of dielectric or silicon oxides can provide shear force isolation. The dielectric oxide of the present invention is disclosed at page 11, lines 10 - 25, to be preferably formed by high density plasma deposition in order to achieve the shear force isolation property while two articles were cited in and attached to the response filed December 13, 2005, which teach forms of silicon oxide which cannot provide shear force isolation. Therefore, the Examiner's assertion of inherency is contrary to the evidence of record (which the Examiner makes no indication of having considered) and certainly does not *necessarily* flow from the disclosure of the preferred material of layer 15 or its location.

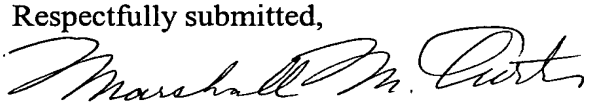
Since Hachimine et al. does not teach or suggest (or even observe) a shear force isolation property for layer 15, rejection for anticipation under 35 U.S.C. §102 is clearly improper *unless* that property is, in fact, properly considered to be inherent and it has been clearly shown in the response filed December 13, 2005 and the above discussion that such an property or function cannot properly be considered to be inherent. Simply put, in the absence of teaching, suggestion or even observation of such a function and particularly in view of the lack of recognition in Hachimine et al. of *any* alternative to removal of layer 14b, Hachimine et al. provides no evidence whatsoever that at least the use of a shear force isolation layer between two stressed layers was known or used by others to provide adjustment of carrier mobility in field effect transistors prior to the invention thereof by Applicants. By the same token, Hachimine et al. does not provide evidence of a level of ordinary skill in the art which would support a

conclusion of obviousness under 35 U.S.C. §103 since the claimed structure is not present in the "final product" and the "intermediate product" is not intended to operate in the intermediate state of fabrication illustrated in Figures 15 and 16 and thus does not adjust carrier mobility and would be ineffective to do so, particularly in view of the discussion of interaction of opposing stresses discussed at paragraph 0214 and the failure of Hachimine et al. to recognize any alternative to removal of layer 14b in order to achieve enhanced carrier mobility in both conductivity types of transistors, much less providing the particular claimed expedient of a shear force isolation layer which simplifies the manufacturing process for the transistors in accordance with the invention.

Conclusion

In view of the foregoing, it is respectfully submitted that the amendments submitted December 13, 2005 should have been entered and that claims 10 - 19 are allowable over Hachimine et al. since no *prima facie* demonstration of either anticipation or obviousness has been or can be made based thereon. Accordingly, it is respectfully requested that the amendments submitted December 13, 2005 be entered and claims 10 - 19 allowed.

Respectfully submitted,



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